

We claim:

1. A method for aggregating and maintaining routing information for a plurality of multicast routing protocols in a network device of a multicast communication network, the network device including a routing table for each of the plurality of multicast routing protocols, the method comprising:

receiving routes submitted by each routing table for the plurality of multicast routing protocols;

storing the routes in a single multicast routing table; and

updating the multicast routing table based on changes made by the plurality of multicast routing protocols to the routes stored in each routing table for the plurality of routing protocols.

2. A method according to claim 1, further including sorting the routes stored in the multicast routing table based on routing protocol type.

3. A method according to claim 1, further including:

selecting a set of unicast routes from a unicast routing table;

storing the set of unicast routes in a memory buffer; and

transferring the set of unicast routes from the memory buffer to the multicast routing table.

4. A method according to claim 3, further including updating the multicast routing table based on changes made to the set of unicast routes.

5. A method according to claim 3, wherein transferring the set of unicast routes includes modifying the set of unicast routes based on a set of predetermined criteria.

6. A method according to claim 3, wherein the memory buffer is a FIFO.

7. A method according to claim 3, wherein the set of unicast routes are selected based on the unicast routing protocol associated with each unicast route.

8. An apparatus for aggregating and maintaining routing information for a plurality of multicast routing protocols in a network device of a multicast communication network, the network device including a routing table for each of the plurality of multicast routing protocols, the apparatus comprising:

5 receiving logic for receiving routes submitted by each routing table for the plurality of multicast routing protocols;

a multicast routing table, operably coupled to the receiving logic, for storing the routes received from each routing table for the plurality of multicast routing protocols; and

10 multicast routing table management logic operably coupled to the multicast routing table, the multicast routing table management logic for updating the multicast routing table based on changes made by the plurality of multicast routing protocols to the routes stored in each routing table for the plurality of multicast routing protocols.

15 9. An apparatus according to claim 8, wherein the multicast routing table management logic includes sorting logic for sorting the routes stored in the multicast routing table based on routing protocol type.

20 10. An apparatus according to claim 8, further including:

a memory buffer operably coupled to a unicast routing table and the multicast routing table, the memory buffer for storing a set of unicast routes selected from the unicast routing table;

wherein the set of unicast routes are transferred from the memory buffer to the multicast routing table.

25 11. An apparatus according to claim 10, wherein the multicast routing table management logic updates the multicast routing table based on changes to the set of unicast routes.

30 12. An apparatus according to claim 10, further including a policy filter operably coupled to the memory buffer and the multicast routing table, the policy filter for modifying the set of unicast routes based on a set of predetermined criteria.

13. An apparatus according to claim 10, wherein the memory buffer is a FIFO.

14. An apparatus according to claim 10, wherein the set of unicast routes are selected based on the unicast routing protocol associated with each unicast route.

5 15. A computer program product for use on a computer system for aggregating and maintaining routing information for a plurality of multicast routing protocols in a network device of a multicast communication network, the network device including a routing table for each of the plurality of multicast routing protocols, the computer program product
10 comprising a computer useable medium having computer readable code thereon, the computer readable program code including:

program code for receiving routes submitted by each routing table for the plurality of multicast routing protocols;

program code for storing the routes in a single multicast routing table; and

15 program code for updating the multicast routing table based on changes made by the plurality of multicast routing protocols to the routes stored in each routing table for the plurality of multicast routing tables.

20 16. A computer program product according to claim 15, further including program code for sorting the routes stored in the multicast routing table based on routing protocol type.

17. A computer program product according to claim 15, further including:

program code for selecting a set of unicast routes from a unicast routing table;

program code for storing the set of unicast routes in a memory buffer; and

25 program code for transferring the set of unicast routes from the memory buffer to the multicast routing table.

18. A computer program product according to claim 17, further including program code for updating the multicast routing table based on changes made to the set of unicast routes.

30 19. A computer program product according to claim 17, wherein transferring the selected unicast routes includes modifying the set of unicast routes based on a set of predetermined

criteria.

20. A computer program product according to claim 17, wherein the memory buffer is a FIFO.

21. A computer program product according to claim 17, wherein the set of unicast routes are selected based on the unicast routing protocol associated with each unicast route.

22. A device comprising:

a set of protocol specific routing tables, each routing table storing multicast routes for a specific multicast routing protocol;

receiving logic for receiving the routes submitted by each protocol specific routing table in the set of protocol specific routing tables;

a multicast routing table, operable coupled to the receiving logic, the multicast routing table for storing the routes received from each protocol specific routing table; and

multicast routing table management logic for updating the multicast routing table based on changes made to the routes in each protocol specific routing table.

23. A method for injecting unicast routes from a unicast routing table into a multicast routing table in a network device of a multicast communications network, the method comprising:

selecting a set of unicast routes from the unicast routing table;

storing the set of unicast routes in a memory buffer; and

transferring the set of unicast routes from the memory buffer to the multicast routing table.

24. A method according to claim 23, wherein transferring the set of unicast routes includes modifying the set of unicast routes based on a set of predetermined criteria.

25. A method according to claim 23, wherein the memory buffer is a FIFO.

26. A method according to claim 23, wherein the set of unicast routes are selected based on the unicast routing protocol associated with each route in the set of unicast routes.

27. An apparatus for injecting unicast routes from a unicast routing table into a multicast routing table in a network device of a multicast communication network, the apparatus comprising:

selection logic for selecting a set of unicast routes from the unicast routing table;

a memory buffer, operably coupled to the unicast routing table and the multicast routing table, the memory buffer for storing the set of unicast routes selected from the unicast routing table; and

transferring logic, operably coupled to the memory buffer, for transferring the set of unicast routes from the memory buffer to the multicast routing table.

28. An apparatus according to claim 27, wherein the transferring logic includes a policy filter for modifying the set of unicast routes based on a set of predetermined criteria.

29. An apparatus according to claim 27, wherein the memory buffer is a FIFO.

30. An apparatus according to claim 27, wherein the set of unicast routes are selected based on the unicast routing protocol associated with each unicast route.

31. A computer program product for use on a computer system for injecting unicast routes from a unicast routing table into a multicast routing table in a network device of a multicast communication network, the computer program product comprising a computer useable medium having computer readable program code thereon, the computer readable program code including:

program code for selecting a set of unicast routes from the unicast routing table;

program code for storing the set of unicast routes in a memory buffer; and

program code for transferring the set of unicast routes from the memory buffer to the multicast routing table.

32. A computer program product according to claim 31, wherein transferring the selected unicast routes includes modifying the set of unicast routes based on a set of predetermined criteria.

33. A computer program product according to claim 31, wherein the memory buffer is a FIFO.

34. A computer program product according to claim 31, wherein the set of unicast routes are selected based on the unicast routing protocol associated with each unicast route.

35. A communication system comprising at least one multicast device, the multicast device for forwarding multicast packets using a plurality of multicast routing protocols, the multicast device comprising:

a single multicast routing table for storing multicast routes for the plurality of multicast routing protocols; and

multicast routing table management logic for updating the multicast routing table based on changes made by the plurality of multicast routing protocols to the routes stored in the multicast routing table.

36. A communication system according to claim 35, wherein the multicast routing table management logic sorts the routes stored in the multicast routing table based on routing protocol type.

37. A communication system according to claim 35, wherein the multicast routing table stores unicast routes related to the plurality of multicast routing protocols.

38. A management information base for configuring a multicast routing table manager for a plurality of multicast routing protocols, the management information base comprising:

at least one management object for defining a multicast routing table manager including a multicast routing table for storing routes for the plurality of multicast routing protocols; and

at least one management object for defining a set of rules for the injection of

routes into the multicast routing table.

39. A management information base according to claim 38, wherein the at least one management object defining a multicast routing table comprises:

a management object defining the state of the multicast routing table.

40. A management information base according to claim 38, wherein the at least one management object defining a multicast routing table comprises:

a management object indicating the maximum number of entries in the multicast routing table.

41. A management information base according to claim 38, wherein the at least one management object defining a multicast routing table comprises:

a management object (WfMrtmCreate) to create or delete multicast routing table manager logic;

a management object (WfMrtmEnable) to enable or disable the multicast routing table manager logic;

a management object (WfMrtmState) indicating the state of the multicast routing table;

a management object (WfMrtmDebug) for generating log messages;

a management object (WfMrtmHoldDownTime) indicating how long a route will be held in the multicast routing table when it becomes reachable;

a management object (WfMrtmFifoSize) indicating the size of a FIFO used to transfer routes from a unicast routing table to the multicast routing table;

a management object (WfMrtmEstimated Networks) indicating the estimated number of routes needed for a network device to retain the multicast routing table;

a management object (WfMrtmMaxRoutes) indicating the maximum number of routes in the multicast routing table; and

a management object (WfMrtmActualRoutes) indicating the total number of routes in the multicast routing table.

42. A management information base according to claim 38, wherein the at least one management object defining a set of rules comprises:

a management object indicating whether to accept or ignore a route.

43. A management information base according to claim 38, wherein the at least one management object defining a set of rules comprises:

a management object (WfIpMrtmInjectRtDelete) to create or delete a route entry;

a management object (WfIpMrtmInjectRtDisable) to enable or disable the route entry;

a management object (WfIpMrtmInjectRtIndex) indicating a rule index number;

a management object (WfIpMrtmInjectRtName) indicating a name for the rule;

a management object (WfIpMrtmInjectRtNetworks) indicating a list of networks that match the rule;

a management object (WfIpMrtmInjectRtAction) to accept or ignore a route;

a management object (WfIpMrtmInjectRtPreference) indicating a preference associated with a route;

a management object (WfIpMrtmInjectRtPrecedence) indicating a precedence value for the rule;

a management object (WfIpMrtmInjectRtInject) indicating a network replacement list;

a management object (WfIpMrtmInjectRtInInterface) indicating an injected unicast routes inbound circuit;

a management object (WfIpMrtminjectRtType) indicating a unicast route type to be selected from a unicast routing table; and

a management object (WfIpMrtmInjectRtMetric) indicating the cost of the route to be injected into the multicast routing table.